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# PESTICIDES AND DRINKING WATER:

## A PUBLIC INFORMATION PACKAGE

This document was prepared by the Massachusetts Interagency Pesticide Task Force, May 1986.

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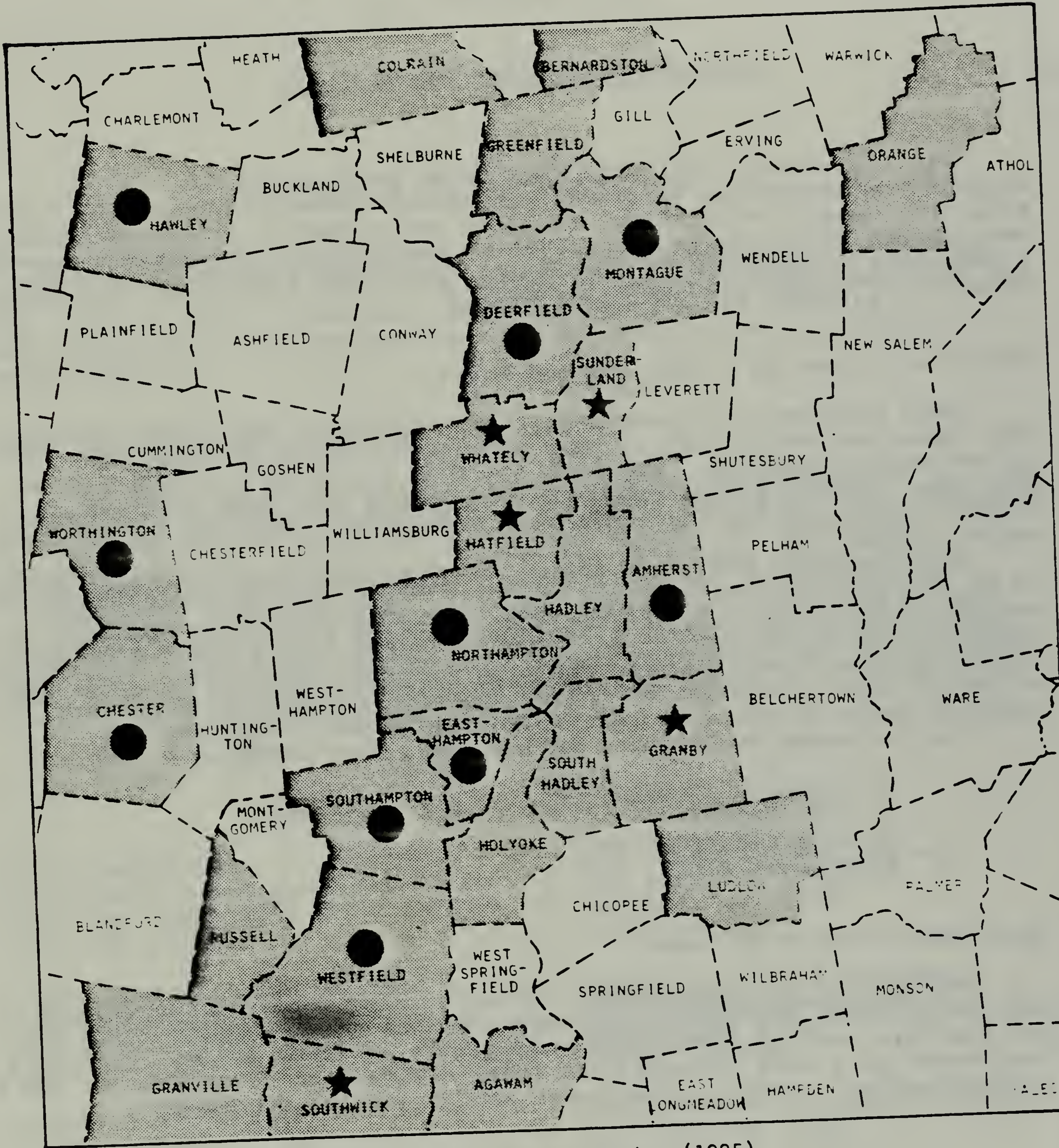

Locations of Pesticide Monitoring (1985)

▨ - Communities in which monitoring has occurred.

● - Communities in which at least one agricultural chemical has been detected (also Westport).

★ - Communities in which at least one agricultural chemical has been detected over guideline (also Westport).

NOTE: In most of the communities depicted above only a very limited number of samples were analyzed for agricultural chemicals. Therefore, the absence or presence of positive results cannot be interpreted as indicative of results on a community-wide basis.

## Choosing Pesticides for Analysis

The Interagency Pesticide Task Force has sampled for eight agricultural chemicals in ground and surface waters (EDB, 1,2-D, 1,3-D, aldicarb, oxamyl, carbofuran, alachlor and dinoseb). These pesticides were chosen for analysis because their chemical characteristics revealed a potential to contaminate groundwater and these pesticides have been detected in groundwater in other states.

### Which Pesticides Do I Look For and Where?

Many citizens are justifiably concerned about the safety of their well water and would like to have it tested for the presence of agricultural chemicals. Sampling for EDB, 1,2-D and 1,3-D should be done near tobacco fields since these products were used on these fields. Sampling for the other five pesticides should be done near potato fields.

From previous sampling, the wells at highest risk have been found to be downgradient and not more than 2000 feet away from the nearest tobacco/potato field. It should also be noted that wells adjacent to property with wells testing positive for agricultural chemicals are generally more likely to test positive for these chemicals. Your Board of Health should be able to provide you with information regarding specific areas of pesticide contamination in your community.

The following information is important when securing a sample:

1) location of well;
2) well depth;
3) well construction;
4) uses of well.

### What About Other Pesticides?

The role of the Interagency Pesticide Task Force is to identify pesticides which may leach to groundwater and also identify where and how they are used as pesticides. Once this has been accomplished, the Task Force will work closely with local offical s to determine if, and to what extent any further groundwater monitoring is necessary.

## Choosing a Private Laboratory

There are many laboratories in the Commonwealth which have the capability to analyze for the presence of many different chemicals in air, soil or water. However, care must be taken in locating a laboratory which can analyze for specific pesticides in drinking water samples.

### State Certified Laboratories

The DEQE certifies various laboratories in Massachusetts according to reliability for certain types of analyses. For example, a laboratory may be certified in several analytical categories: chemical (cyanide, endrin, 2,4,5-T); chemical class (trace metals, trihalomethanes, minerals); and chemical activity (corrosivity).

Below is the most recent list of laboratories certified by the Commonwealth for all or most environmental variables. It should be noted that there is no current certification program for laboratories which analyze the pesticides of concern (EDB, 1,2-D, 1,3-D, alachlor, dinoseb, oxamyl, aldicarb and carbofuran).

### Commercial Laboratories Certified by DEQE

Energy Resources
205 Alewife Brook Parkway
Cambridge, MA 02138
(617) 661-3111

Arnold Greene Labs
6 Huron Avenue
Natick, MA 01760
(617) 235-7330

Skinner and Sherman
300 Second Ave.
Waltham, MA 02154
(617) 890-7200

Camp, Dresser and McKee
One Center Plaza
Boston, MA 02108
(617) 742-5153

Whitman and Howland
45 William Street
Wellesley, MA 02181
(617) 237-5000

GCA, Technology Division
213 Burlington Road
Bedford, MA 01730
(617) 275-9000

Cambridge Analytical Ass.
205 Alewife Brook Pkwy.
Boston, MA 02108
(617) 232-2207

Enviromental Research & Techn.
696 Virginia Road
Concord, MA 01742
(617) 369-8910

Clean Harbors
5 Strathmore Road
Natick, MA 01760
(617) 655-8863

GHR Analytical
26 Main Street
Lakeville, MA 02346
(617) 947-5077

Stevens Water Analysis
38 Montvale Ave.
Stoneham, MA 02180
(617) 438-6114

Toxikon
259 Allston Street
Cambridge, MA 02139
(617) 661-0991

New England Chemical
210 Williams Street
Dighton, MA 02764
(617) 823-0885

Tighe and Bond
30 Payson Ave.
Easthampton, MA 01027
(413) 533-3991

Reitzel Laboratories
10 Kendall Place
Boylston, MA 01506
(617) 869-2893

Berkshire Enviro-Labs
Route 102
Lee, MA 01238
(413) 243-1416

Metcalf & Eddy
50 Staniford Street
Boston, MA 02114
(617) 723-7890

Standard Methods Lab
Quabbin Bldg., Valley Rd.
Barre, MA 01240
(617) 355-4057

Barclay Chemical
150 Coolidge Ave.
Watertown, MA 02172
(617) 926-3400

Revet Env. & Analytical
7 Neponset Street
Worcester, MA 01606
(617) 853-9028

Water Control Lab
106 South Street
Hopkinton, MA 01748
(617) 528-8700

Lycott Env. Research
600 Charlton St.
Southbridge, MA 01550
(617) 765-0101

Burgess Analytical
525 Ashland Street
North Adams, MA 01247
(413) 663-6769

Oliveira Laboratories
1498 High Street
Bridgewater, MA 02324
(617) 697-2650

Briggs Associates
400 Hingham Street
Rockland, MA 02370
(617) 871-6040

Env. Testing Lab
170 Montgomery Street
Chicopee, MA 01021
(413) 592-2500

This list of certified laboratories does not imply endorsement by the agencies represented on the Interagency Pesticide Task Force or the Commonwealth of Massachusetts. This list is merely intended to provide direction for private citizens who need to know which private laboratories in the State of Massachusetts are technically available to perform drinking water analysis for certain agricultural chemicals for a fee.

## Other Laboratories

Consult your Yellow Pages for other private laboratories in your area. Suggested headings are "Analytical Laboratories", "Environmental Consulting Firms" and "Environmental Laboratories".

## Asking the Right Questions

It is important to find out the following information from laboratories to determine whether or not they are capable of reliable service in analyzing for pesticides in water:

1. Have you ever analyzed for pesticides in water samples? Were they tapwater samples or other water samples? (you are interested in tap water samples).
2. How are samples collected?
3. What analytical method do you use?
4. What is the limit of detection?

The following provides some analytical methods and detection limits which are acceptable:

| Pesticide | Analytical Method | Limit of Detection* |
|---|---|---|
| EDB | EPA Method 624; | 0.03 ppb** |
| 1,2-D | EPA Method 624; | 0.03 ppb |
| 1,3-D | EPA Method 624; | 0.03 ppb |
| Aldicarb | HPLC carbamate analysis, post-column derivitization with absorbance detection; | 0.35 ppb |
| Carbofuran | " " | " " |
| Oxamyl | " " | " " |
| Alachlor | Extract from water; Gas chromatograph analysis with specific nitrogen specific detector; | 0.35ppb |
| Dinoseb | " " | 1.00 ppb |

*Limit of Detection = level at which there is an absolute confidence in the identification or quantification.

**ppb = parts per billion

## Approximate Costs

The cost for analysis will vary between different private laboratories. But, regardless of which laboratory is chosen, the cost per analysis should decrease with the number of samples submitted for analysis. Therefore, it is very important to coordinate with other members of your community to reduce the cost of analysis.

## What Do I Do With the Lab Results?

If your drinking water sample is found to have detectable amounts of any of the eight agricultural chemicals that the Commonwealth has monitored for, contact your local Board of Health. The Board of Health will refer your situation to the appropriate state agency for further assistance.

Pursuant to M.G.L. Chapter 111, Section 159, the DEQE is required to maintain records relative to any waters used by any person as a source of water supply. For this reason, and so that we may continue to provide you and your community with accurate information, the Commonwealth requests that copies of your lab results, both positive and negative, be forwarded to the Massachusetts Department of Environmental Quality Engineeering, Division of Water Supply, 10th Floor, Boston, MA, 02108.

## Treatment of Drinking Water/Alternative Sources of Drinking Water

In general, one or more of the following options is available to the owner of a contaminated private well:

1) Purchase bottled water or boil water for drinking;
2) Transport water from an uncontaminated source;
3) Drill a new well;
4) Tie into a municipal water system or other private well;
5) Install a water purification system.

This description of available options does not imply any type of endorsement by the agencies represented on the Interagency Pesticide Task Force or the Commonwealth of Massachusetts. This material is intended solely to present some of the apparent applications and limitations of each option.

### Purchase Bottled Water

In Massachusetts, drinking water standards do not apply to bottled water. Therefore, the State does not require testing to determine if bottled water meets these standards, and the consumer is not assured that this water is free of pollutants.

Purchasing bottled water can also be expensive, and boiling drinking water to remove volatile organic compounds (VOCs) raises questions about the risk of inhaling vapors. In addition, neither of these approaches involves water used in showers, humidifiers, or vaporizers; all potential sources of exposure.

### Transport Uncontaminated Water

Potable water can be transported from public sources such as schools or mobile water tanks. Water tanks are made available through the state civil defense agency, after state approval of a local declaration of emergency. Although the power to declare a local state of emergency is not specifically addressed in state laws, it is implied, and reinforced by established practice. Your town counsel should research when and under what circumstances a community can take advantage of the assistance available through a local declaration of emergency.

### Well Replacement

Depending on site conditions and the contaminant(s), a new well upgradient of the contaminated area or deeper into a separate aquifer may provide sufficient potable water. However, drilling a new well may be impractical due to cost or other environmental factors.

## Tie into Municipal System/Other Private Well

In communities where there is an existing municipal water supply system, it is sometimes possible for a homeowner to temporarily or permanently tie into that system. It may also be possible for a private well owner to cross-connect with another private well.

## Install a Water Purification System

There are many kinds of water purifiers available. Some may remove agricultural chemicals to acceptable levels, but many of the smaller units may not. Prices for these devices range from $100 to well over $3000, depending on the method used to remove contaminants and the size of the unit. The most common designs include the following:

### Activated Carbon Filters

In 1980, the EPA, as a consumer service, conducted a study of commercially available home units containing activated carbon. In general, faucet mounted units were found to be less effective (4-69% removal) than the line bypass units (23-99% removal).

The EPA study also measured microbial concentrations in filter effluents of all the devices because of the potential health hazard from bacterial growth on carbon filters during periods of non-use. The highest bacterial populations were found in the first water through the filter after a period of non-use.

### Reverse Osmosis and Ultra-Violet Activated Carbon Filters

The EPA study also included testing reverse osmosis, ultra-violet and ozone-carbon units. During this phase, certain common organic contaminants (TCE, PCE, carbon tetrachloride, etc.) were added to the test groundwater filtered through the carbon units. Reductions ranged from 55% to 99%.

The results of this study have a very limited use. Units were tested under laboratory conditions with a selected groundwater sample and technical grade organic compounds. The effectiveness and performance of these commercial in-home units should still be considered unknown for any specific well site.

### Home Air Stripping Towers

Recently, a packed tower aeration system for home wells was put on the market. The manufacturer provided no scientific data to back claims of 90% removal of most commonly detected VOCs in groundwater. Since the system is designed to run continuously and "return treated water to the well by gravity for storage" (product literature), it is unclear how many times the water must pass through the tower before being completely decontaminated.

## Applications and Limitations of Home Treatment Units

Carbon adsorption and air stripping are proven unit processes for treating some contaminated groundwater on a large scale. This technology is being adapted for efficient and reliable performance in home treatment units as either permanent or interim treatment. Much more design, operational and economic data is necessary before this option can be fully evaluated.

The decision to purchase a water purification system rests with the individual. However, without the necessary scientific and engineering expertise, it is often difficult for an individual well owner to ascertain how effective any given device is for a specific site or a specific chemical. If product test results are available, they must be evaluated in terms of extent of testing and detection limits of the tests.

The performance of a home water treatment unit is affected by the uncertainties associated with individual responsibility for maintenance and monitoring, as well as the chemical complexities of each situation. After choosing the unit that best meets removal requirements, it is essential that proper maintenance and monitoring be performed to assure continuing performance. If the unit is used improperly or not maintained, the users may be exposed to increased levels of contaminants. Some form of maintenance service might be necessary to assist the owner with operation and maintenance.

## Interim Drinking Water Guidelines

| | |
|---|---|
| Alachlor | 2.0 ppb |
| EDB | 0.04 to 0.10 ppb (supply monitored for up to two years) |
| | 0.10 ppb (supply closed) |
| 1,2-D | 1.0 ppb |
| 1,3-D | 1.0 ppb |
| Dinoseb | 5.0 ppb |
| Carbofuran | 10.0 ppb |
| Aldicarb | 10.0 ppb |
| Oxamyl | 50.0 ppb |

If you have any questions on the health effects of any of the following chemicals please call:

The Massachusetts Department of Public Health
Division of Environmental Epidemiology & Toxicology
(617) 727-2660

# ALACHLOR

## What is alachlor?

Alachlor is a pesticide manufactured by Monsanto and is known under the trade name Lasso. It is the largest volume agricultural herbicide in the United States. It is used as a preemergent herbicide for use on broadleaf weeds and grasses and on corn, soybeans, peanuts, and other crops. The U.S. Environmental Protection Agency (EPA) is currently reviewing the registration status of alachlor due to concerns about its long-term health effects.

## Where has alachlor been found?

Alachlor has been found in groundwater in Nebraska, Iowa, Maryland, Massachusetts, and Ontario at levels ranging from 0.01 to 16.6 parts per billion (ppb). It has also been found in surface water in at least nine states and in municipal water supplies in Ohio. Residues of alachlor have also been found on crops.

## What happens to alachlor in the environment?

Alachlor has the potential to leach through soils. It can move better through sandy soils than through silty clay loam soils. Microbial degradation can take place in soil, and the average persistence of alachlor in soils is about six to ten weeks. Once alachlor reaches water, however, it is persistent in the water.

## What are the short-term health effects of exposure to alachlor?

Alachlor is not very acutely toxic. Exposure to alachlor can produce mild to moderate skin and eye irritation.

## What are the long-term health effects of exposure to alachlor?

Alachlor is a potent carcinogen (cancer-causing substance) in rats and mice. Multiple studies have shown alachlor to produce tumors in multiple organs in rats, and in one organ in mice. No human evidence of carcinogenicity exists. Due to the animal data, therefore, it is prudent to treat alachlor as a probable human carcinogen.

Other chronic effects of alachlor, based on animal studies, include toxic effects to the liver and kidneys. Alachlor has not been shown to cause birth defects. Little data exists on alachlor's potential to produce mutations or genetic effects.

## How are people exposed to alachlor?

Exposure to alachlor can occur through all three routes of exposure-by ingestion, inhalation, and skin absorption. Alachlor is rapidly and easily absorbed through the skin. People can ingest alachlor in foods containing alachlor residues or by drinking alachlor-contaminated water.

# ALDICARB

## What is aldicarb?

Aldicarb is an insecticide manufactured by Union Carbide and sold under the trade name TEMIK. It provides effective control against the Colorado potato beetle and the golden nematode. It is a restricted use product for use by certified applicators only.

## Where has aldicarb been found?

Aldicarb residues have been found in groundwater in Massachusetts, New York, Wisconsin, Florida, Maine, Arizona, and Virginia. Food tolerances have been established for some foods. Residues of aldicarb in foods have been found.

## What happens to aldicarb in the environment?

Aldicarb has been found to leach in fine to coarse textured soils, including those soils with high organic matter content. It has a low, but appreciable, solubility in water. In an effort to reduce further groundwater contamination, stringent label/use restrictions have been established in Massachusetts. For example, a change in the application time when soil temperatures are warmer and less rainfall occurs decreases the chance of aldicarb reaching groundwater. Furthermore, it can only be used in alternate years, and cannot be applied within 1000 feet of a well.

## What are the short-term health effects of aldicarb?

Aldicarb is highly acutely toxic. As a carbamate, its effect is to interfere with the transmission of nerve impulses. Symptoms of acute poisoning include perspiration, salivation, nausea, constriction of pupils, and chest tightness. These effects are rapidly reversible when exposure ceases. The two major breakdown products of aldicarb, aldicarb sulfoxide and aldicarb sulfone, have the same effects. The sulfoxide is about as toxic as aldicarb, while the sulfone is slightly less toxic than aldicarb.

## What are the long-term health effects of aldicarb?

Aldicarb has not been shown to be carcinogenic, mutagenic, or to cause birth defects in long-term animal studies. These studies found the most sensitive effect, even after long-term exposure, was cholinesterase inhibition. The guideline established for aldicarb should protect everyone, including the pregnant woman and the fetus, against cholinesterase inhibition.

## How are people exposed?

Aldicarb can be absorbed through all routes of exposure, that is, skin, inhalation, and ingestion. The most significant route of exposure to the general public is expected to be ingestion, such as drinking water contaminated with aldicarb.

## CARBOFURAN

### What is carbofuran?

Carbofuran is a pesticide used on crops and soil to control insects, root worms, and mites. Carbofuran is manufactured by the FMC Corporation and is also marketed by the Chemagro Division of Mobay Chemical Company.

### Where has carbofuran been found?

Carbofuran has been detected in Wisconsin wells at levels up to 270 parts per billion (ppb). It has also been found in shallow aquifers under or near treated fields in several states including Massachusetts at levels up to 50 ppb. Carbofuran has been found in foods such as corn, alfalfa, rice, and potatoes.

### What happens to carbofuran in the environment?

Carbofuran will dissolve relatively easily in water and is able to move in soil, particularly in sandy soil. It takes about 30 to 60 days for half of the carbofuran in soil to break down.

### What are the short-term health effects of exposure to carbofuran?

Carbofuran is very acutely toxic, producing inhibition of the enzyme cholinesterase. Cholinesterase is an important enzyme involved in the transmission of nerve impulses. Carbofuran's effects are rapidly reversible once exposure stops. Symptoms of acute exposure include general fatigue, pinpoint pupils, light headedness, and nausea. These effects are short-lived and can be treated.

### What are the long-term health effects of exposure to carbofuran?

No carcinogenic (cancer-causing) effects, mutagenic effects (capable of affecting genetic material), or birth defects have been shown to be caused by carbofuran. Long-term animal studies consistently show effects of cholinesterase inhibition, which appears to be the most sensitive indicator of the toxicity of this chemical. That is, the guideline established for carbofuran in drinking water should protect against cholinesterase inhibition as well as any other possible effect. It should also protect a pregnant woman and the developing fetus.

### How are people exposed to carbofuran?

Exposure to carbofuran can occur through the consumption of food crops containing carbofuran residues and through drinking water contaminated with carbofuran. Although carbofuran can be absorbed through the skin, it is not readily absorbed.

# 1,2-DICHLOROPROPANE
# and 1,3-DICHLOROPROPENE

## What are 1,2-dichloropropane and 1,3-dichloropropene?

1,2-Dichloropropane (1,2-D) and 1,3-dichloropropene (1,3-D) are constituents of a fumigant called Vorlex, which is used to control nematodes. In Massachusetts, Vorlex is being used on strawberry and tobacco crops. Prior to 1983, about 45% of Vorlex was 1,3-D and 16% was 1,2-D. Since 1983, the formulation contained about 40% 1,3-D and only about 0.5% 1,2-D.

## Where have they been found?

Residues of both 1,2-D and 1,3-D have been found in water in the United States. 1,2-D is much more commonly found, since it is more persistent in water than 1,3-D. Connecticut has reportedly found up to 45 ppb of 1,2-D in water. They have not found 1,3-D. New York, California, and Massachusetts have detected 1,2-D in water samples in their states, but not 1,3-D. We do not know what amount, if any, of these compounds may be present in foods.

## What happens to 1,2-D and 1,3-D in the environment?

1,2-D is very persistent in water, while 1,3-D is not. It also appears that 1,2-D moves more easily through soil than 1,3-D, meaning that it can reach groundwater more easily. Thus, unlike 1,2-D, 1,3-D is not persistent and appears to undergo rapid environmental transformation.

## What are the short-term health effects?

1,3-D is more toxic on the short-term level than 1,2-D, although short-term effects on these compunds are not of as much concern as the long-term effects. 1,3-D is considered irritating to the eyes, skin, and mucous membranes. 1,2-D has shown these same effects but at higher exposure levels. Short-term studies in animals have also produced effects on the liver and kidneys.

## What are the long-term health effects?

Both 1,3-D and 1,2-D have produced cancers in laboratory animals. 1,3-D appears to be a stronger carcinogen, since it produced evidence of carcinogenicity in two animal species, while 1,2-D produced evidence of carcinogenicity in only one animal species. Furthermore, 1,3-D produced cancer in more than one organ site in the animals, while 1,2-D produced cancers in only one organ site. Evidence of carcinogenicity in animals becomes stronger when a chemical produces cancers in multiple sites in multiple species.

It is widely accepted in the scientific community that positive results in well-conducted animal studies means the chemical poses a carcinogenic hazard to humans. Furthermore, both 1,2-D and 1,3-D show evidence of causing genetic mutations. No information exists for either chemical on reproductive effects.

## How do people get exposed?

In general, 1,3-D has usually not been found in water, because it is not persistent. 1,2-D has, however, been found in water. One reason the formulation of Vorlex was changed in 1983 was because of the concern of 1,2-D's persistence in water. No information exists on the presence of these chemicals in foods.

# DINOSEB

## What is dinoseb?

Dinoseb is an herbicide and insecticide produced by Dow Chemical Company, Drexel Chemical Company, and Verlax Chemical Corporation. Its common names include DNPB and DNSPB. Its trade names include: Dow General Weed Killer, Sinox General, and Preemerge. Dinoseb's primary use is the control of weeds on various agricultural field crops.

## Where has dinoseb been found?

Tolerances or limits in foods, such as wheat and various fruits & vegatables, have been established for dinoseb. However, no findings of dinoseb have been reported in national monitoring of foods. Dinoseb has been found in groundwater in Massachusetts and New York.

## What happens to dinoseb in the environment?

Dinoseb appears to be persistent in water, although it does not dissolve readily in water. Dinoseb can be degraded in soil; it takes anywhere from 34 to 111 days for one half of the amount of dinoseb in soil to break down.

## What are the short-term health effects of exposure to dinoseb?

Dinoseb is highly acutely toxic. That is, small amounts of dinoseb can produce symptoms shortly after exposure. Symptoms of short-term exposure include increased body temperature, sweating, fatigue, thirst, and nausea.

## What are the long-term health effects of exposure to dinoseb?

Data on the potential carcinogenic (cancer potential), mutagenic (ability to affect genetic material), or reproductive effects of dinoseb are inadequate at this time. Studies have shown that dinoseb does not readily cross the placental membrane. The Environmental Protection Agency (EPA) is requiring the registrants of dinoseb to perform carcinogenicity testing, the results of which are due in 1988. Other animal experiments have shown that dinoseb alters the levels of some enzymes in the body and causes decreased growth in animals. Effects on the liver have also been noted.

## How are people exposed to dinoseb?

Exposure to dinoseb can occur through the ingestion of dinoseb residues on food or in drinking water. Dinoseb can also be absorbed through the skin, although not as easily as from food or water. Little data exist on actual levels of exposure in humans.

# ETHYLENE DIBROMIDE (EDB)

## What is ethylene dibromide?

Ethylene dibromide (EDB) is a pesticide that has been used in the production and processing of grain, grain-based products, and citrus fruits for many years. It is used to protect against root worms. In Massachusetts, EDB has been used primarily on tobacco crops.

## Where has EDB been found?

In 1984, the US Environmental Protection Agency (EPA) estimated that everyone in the US has been potentially exposed to significant levels of EDB in the diet because of its use on grains. EDB has also been found in groundwater, including in Massachusetts.

## What are the short-term health effects of exposure to EDB?

EDB is easily absorbed by the skin, by ingestion, and by inhalation. Acute overexposure to EDB can cause eye, skin, and respiratory irritation. Damage to the liver, kidneys, spleen, cardiovascular and nervous systems may also occur. Chronic toxicity or long-term health effects, however, is the primary concern with EDB.

## What are the long-term health effects of exposure to EDB?

EDB is a potent carcinogen (cancer-causing substance). It has produced tumors in multiple organs in two species of animals by all three routes of exposure. Therefore, EDB should be regarded as a potential human carcinogen. EDB and some of its breakdown products can also affect the genetic material, DNA. Thus, EDB has the potential to produce genetic damage in humans.

EDB has also caused severe reproductive disturbances in a number of animal species.

## How are people exposed to EDB?

Exposure to EDB can occur through all routes - ingestion, inhalation, or absorption through the skin. Residues of EDB have been found in widely varying amounts in food. In 1984, the Massachusetts Department of Public Health (DPH) issued strict rules to limit the level of EDB residues in food. At this time, no detectable amount of EDB is allowed in baby food. The level in ready-to-eat foods must be below 1 ppb.

## OXAMYL

### What is oxamyl?

Oxamyl is a chemical used primarily to control nematodes on potato crops. A common trade name for oxamyl is Vydate, manufactured by Dupont. Oxamyl belongs to a group of chemicals known as carbamates. Another member of the carbamate class is aldicarb, or TEMIK.

### Where has it been found?

The U.S. Food and Drug Administration (FDA) has monitored oxamyl in foods throughout the U.S. since 1980. In their monitoring, they have not yet detected oxamyl in foods in about 2000 samples taken so far. Oxamyl has been detected in groundwater in Massachusetts, New York, and Rhode Island.

### What happens to oxamyl in the environment?

Oxamyl's persistence in the environment is highly ph dependent. It is rapidly broken down in water that is basic, but is relatively stable in acidic water. Sunlight, aeration and high temperatures will hasten the breakdown of oxamyl in water. The breakdown products of oxamyl are considerably less toxic than oxamyl itself. In soil, it is not very persistent, with about 6-8 days required for half of the oxamyl in the soil to be broken down.

### What are the short-term health effects of oxamyl?

Oxamyl's short-term effects are typical of carbamates. These chemicals inhibit a certain enzyme in the nervous system (cholinesterase) important in the transmission of nerve impulses. This effect is quickly reversible once exposure stops, and can be medically treated. Typical symptoms of overexposure include perspiration, salivation, pinpoint pupils, and tearing.

### What are long-term health effects of oxamyl?

Oxamyl has been studied in animals for carcinogenic, mutagenic, and birth defects effects, and has not been shown to produce any of these. Long-term studies in animals have shown primarily effects on the body and organ weights of exposed animals. These effects seem to occur at about the same levels as effects on cholinesterase activity. The guideline established for oxamyl should protect everyone, including the pregnant woman and the fetus, against cholinesterase inhibition.

How do people get exposed?

Information on actual exposure to oxamyl in humans is lacking. As stated earlier, the FDA has not yet found oxamyl residues in food. Exposure to oxamyl could occur through drinking water. Oxamyl is not easily absorbed through the skin, which means that little exposure should occur when taking showers, for example. Thus, the general population is not expected to be subject to skin or inhalation exposure to oxamyl although these routes may be significant to pesticide applicators and agricultural workers.